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12. A projection optical system according to claim 11, wherein said correcting means comprises at least one optical member having predetermined form birefringence.

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13. A projection optical system according to claim 12, wherein said at least one optical member is arranged so that a distribution, including a distribution of form birefringence produced by said at least one optical member, is effective to cancel the birefringence to be produced by said optical elements.

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14. A projection optical system according to claim 12, wherein said at least one optical member is arranged to produce form birefringence on the basis of a grating having a period smaller than a wavelength used.

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15. A projection optical system according to claim 14, wherein said grating is provided on the surface of said optical element.

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16. A projection optical system according to claim 11, wherein said correcting means comprises at least one optical member having a predetermined stress distribution.

17. A projection optical system according to claim 16, wherein said at least one optical member is arranged so that a distribution, including a distribution of stresses produced by said at least one optical member, is effective to cancel the birefringence to be produced by said optical elements.

18. A projection exposure apparatus comprising:
an illumination system for illuminating a first object with light; and

a projection optical system for projecting a pattern of the first object illuminated with the light from said illumination system, onto a second object, said projection optical system having at least one correcting element for correcting birefringence of said projection optical system.

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C4 } 19. A projection exposure apparatus according to claim 18, wherein said illumination system illuminates the first object with slit-like light, and further comprising a scanning device for simultaneously scanning the first and second objects in a widthwise direction of the slit-like light, at a speed ratio corresponding to a projection magnification of said projection optical system.

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B3 } 20. A projection exposure apparatus according to claim 18, wherein said correcting means comprises at least one optical member having predetermined form birefringence.

21. A projection exposure apparatus according to claim 20, wherein said at least one optical member is arranged so that a distribution, including a distribution of form birefringence produced by said at least one optical member, is effective to cancel the birefringence to be produced by said optical elements.

22. A projection exposure apparatus according to claim 20, wherein said at least one optical member is

arranged to produce form birefringence on the basis of a grating having a period smaller than a wavelength used.

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23. A projection exposure apparatus according to claim 22, wherein said grating is provided on the surface of said optical element.

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24. A projection exposure apparatus according to claim 18, wherein said correcting means comprises at least one optical member having a predetermined stress distribution.

25. A projection exposure apparatus according to claim 24, wherein said at least one optical member is arranged so that a distribution, including a distribution of stresses produced by said at least one optical member, is effective to cancel the birefringence to be produced by said optical elements.

26. A device manufacturing method including a process for printing a device pattern on a substrate by use